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we know of. For fresh-water aquaria, use glass jars and dishes. Large aquaria can be made of glass set in a soapstone frame, made water-tight by cement. Any glazier can make one. Shirley Hibbard thus describes a large tank :—

“For the adornment of a dwelling-room, or a conservatory, an oblong tank, measuring three feet by one foot six inches deep, would be very suitable. It must be borne in mind, then, that when a tank is filled, its weight is enormous, and hence it is difficult, sometimes impossible, to move it without first removing the whole or greater portion of its contents. Strength in the joints to resist pressure from within, and strength in the table or other support on which the tank is placed, is of the first importance. The bottom of such a tank is best formed of a slab of slate, and the two ends may be of slate also; the front and back of plate or very stout crown glass. The most elegant form for such a body is that of the double cube, the length of the tank being just double its width and depth, so that if it were cut into two equal parts, two cubes would be formed. The glass must be set in grooves in the slate, and bound outside with zinc or turned pillars of birch wood. The best cement is white-lead putty, or what is known as Scott's Cement, the composition of which it is not in my power to inform the reader. If a coating of shell-lac, dissolved in naphtha, and made into a paste with whiting, were laid over the white lead cement, the water would be kept from contact with the lead, and the tank would require less seasoning.

The use of slate at the ends is to enable us to affix rock-work, or carry across a rude arch; the cement used in constructing rock-work does not adhere to glass. But if rock-work is not thought desirable, the slate ends may be dispensed with, and the vessel may be composed wholly of glass, except the bottom, which may be of slate or wood. I have seen some handsome tanks composed wholly of wood and glass; it is only necessary to choose well-seasoned material, and unite the joints very perfectly.

L. Q., Pennsylvania. — We can scarcely tell from your drawing what the object can be. It is probably a *Polyzoön*, and possibly a species of *Lophopus*, mentioned in the June number of the *NATURALIST*, and if so, is very rare, and specimens would be very desirable.

NATURAL HISTORY CALENDAR.

THE INSECTS OF AUGUST. — During this month great multitudes of bugs (*Hemiptera*) are found in our fields and gardens; and to this group of insects the present chapter shall be devoted. They are nearly all injurious to crops, as they live on the sap of plants, stinging them with their long suckers. Their continued attacks cause the leaves to wither and blight.

The grain Aphis, at certain years, desolates our wheat-fields. We have seen the heads black with these terrible pests. They pierce the grain, extract the sap, causing it to shrink and lose the greater part of its bulk. It is a most insidious and difficult foe to overcome.

The various leaf-hoppers, *Tettigonia* and *Ceresa*, abound on the leaves of plants, sadly blighting them; and the *Tettigonias* frequent

damp, wet, swampy places. A very abundant species on grass produces what is called "frog's spittle." It can easily be traced through



Fig. 1. all its changes by frequently examining the mass of froth which surrounds it. *Tettigonia vitis* blights the leaf of the grape-vine. It is a tenth of an inch long, and is straw-yellow, striped with red. *Tettigonia rosæ*, a still smaller species, infests the rose, often to an alarming extent.

The *Notonecta*, or water boatman, is much like a *Tettigonia*, but its wings are transparent on the outer half, and its legs are fringed with long hairs, being formed for swimming. They row over the surface in pursuit of insects. *Notonecta*

undulata of Say (Fig. 1, from Sanborn) is a common form in New England.

Another insect-hunter is the singular *Ranatra fusca* (Fig. 2, from Sanborn).

It is light brown in color, with a long respiratory tube which it raises above the surface of the water when it

Fig. 2.

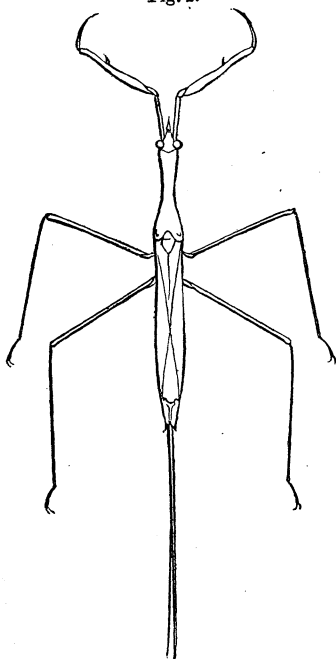
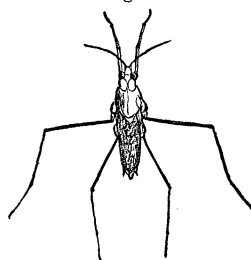


Fig. 3.



wishes to breathe. This species connects the Water-boatman with the Water-skaters, Fig. 4. or Gerris, a familiar insect, of which *Gerris paludum* (Fig. 3) is commonly seen running over the surface of streams and pools.



Reduvius and its al-

lies belong to a large family of very useful insects, as they prey largely on caterpillars and noxious insects. Such is *Pirates pictipes* (Fig. 4), a common species. It is an ally of *Reduvius personatus*, a

valued friend to man, as in Europe it destroys the bed-bug. Its specific name is derived from its habit while immature, of concealing itself in a case of dust, the better to approach its prey.

Another friend of the agriculturist is the *Phymata erosa* (Fig. 5). Mr. F. G. Sanborn states that "these insects have been taken in great numbers upon the linden trees in the city of Boston, and were seen in the act of devouring the Aphides, which have infested the shade-trees of that city for several years past.

They are described by a gentleman who watched their operations with great interest, as 'stealing up to a louse, coolly seizing and tucking it under the arm, then inserting the beak and sucking it dry.' They are supposed to feed also on other vegetable eating insects as well as the plant louse."



Fig. 5.

Phytocoris lineolaris swarms in our gardens during this month. It is described and figured in Harris's Treatise on Insects. Closely allied, though generally wingless, is that enemy of our peace the bed-bug. It has a small, somewhat triangular head, orbicular thorax, and large, round, flattened abdomen. It is generally wingless, having only two small wing-pads instead. The eggs are oval, white; the young escape by pushing off a lid at one end of the shell. They are white, transparent, differing from the perfect insect, in having a broad, triangular head, and short thick antennæ. Indeed, this is the general form of lice (*Pediculus vestimenti*, and *P. capitis*), to which the larva of *Cimex* has the closest affinity. Some Cimices are parasites, infesting pigeons, swallows, etc., in this way also showing their near location to lice. Besides the *Reduvius*, the cockroach is the natural enemy of the bed-bug, and destroys large numbers. Houses have been cleared of them after being thoroughly fumigated with brimstone.

Closely allied to the bed-bug are the lice (*Pediculus*). These degraded, wingless forms of Hemiptera, still preserve the mouth parts in the form of a sucker, but it is fleshy and retractile. The triangular head has two simple eyes. The body is rather long, the abdomen oval. They are generally white, and of minute size. The metamorphosis is very incomplete,—that is, there are but slight differences between the larva and the imago. The species of *Pediculus* are blood-suckers, and parasitic upon man and some of the mammalia; different species being found upon different regions of the body. Different varieties are found living upon the bodies of different races of men.

An allied group, the *Mallophaga*, bird-lice, live on the hair of mammalia and feathers of birds. In this group there are distinct jaws. Nearly every bird and mammal has its parasite, so that the number of species is actually very large.

During this month the ravages of grasshoppers are, in the West, very wide-spread. We have just received from Major F. Hawn, of Leavenworth, Kansas, a most interesting account of the Red-legged Locust (*Caloptenus femur-rubrum*). "They commence depositing their eggs the latter part of August, which are fusiform, slightly gibbous, and of a buff-color. They are placed about three-fourths of an inch beneath the surface, in a compact mass around a vertical axis pointing obliquely up and outward, and are partially cemented together, the whole presenting a cylindrical structure, not unlike a small cartridge. They commence hatching in March, but it requires a range of temperature above 60° F. to bring them to maturity, and under such conditions they become fledged in thirty-three days, and in from three to five days after, they enter upon their migratory flight.

"Their instincts are very strong. When food becomes scarce at one point, a portion of them migrate to new localities, and this movement takes place simultaneously over large areas. In their progress they stop at no obstacle they can surmount. In these excursions they often meet with other trains from an opposite direction, when both join in one.

"The insects are voracious, but discriminating in their choice of food, yet I know of no plant they reject if pressed by hunger; not even the foliage of shrubs and trees, including pine and cedar."—A. S. P.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

* LYCEUM OF NATURAL HISTORY. *New York, April 22, 1867.*—Prof. Newberry read a paper on the "Ancient Vegetation of North America." In this paper the Professor briefly reviewed the records with which geology has furnished us of the changes that have taken place in the vegetation of this continent, from the earliest palæozoic ages to the present time. Of this sketch the most important facts cited were as follows:—

First,—Vegetables only have the power to assimilate inorganic substances in nature, the animal kingdom being wholly dependent on the vegetable for its substance, and could not exist without it. Plants must therefore have preceded animals upon the globe, and spontaneous generation, if it were possible, should result in the production of plants first, of animals only from them. Remains of plants occur in the oldest rocks, but only of the lowest types, seaweeds.

Second,—The first land plants appear in the Upper Devonian rocks,